

---

VOLUME 351



1999

---

# TRANSACTIONS

OF THE

---

AMERICAN MATHEMATICAL SOCIETY

---

**EDITED BY**

Rodrigo Bañuelos  
William Beckner  
Bruce E. Blackadar  
Daniel M. Burns  
Charles W. Curtis  
Lawrence Ein  
Philip J. Hanlon  
Barbara Lee Keyfitz  
John Luecke  
John Mallet-Paret  
Stewart Priddy  
Peter Shalen, Managing Editor  
Alice Silverberg  
Theodore Slaman  
Robert J. Stanton  
Chuu-Lian Terng  
Robert F. Williams

---

PROVIDENCE, RHODE ISLAND USA

---

ISSN 0002-9947

## Transactions of the American Mathematical Society

This journal is devoted entirely to research in pure and applied mathematics.

**Submission information.** See **Information for Authors** at the end of this issue.

**Publisher Item Identifier.** The Publisher Item Identifier (PII) appears at the top of the first page of each article published in this journal. This alphanumeric string of characters uniquely identifies each article and can be used for future cataloging, searching, and electronic retrieval.

**Postings to e-MATH.** Articles are posted to e-MATH individually soon after proof is returned from authors and before appearing in an issue.

**Subscription information.** *Transactions of the American Mathematical Society* is published monthly. Beginning in January 1996 *Transactions* is accessible from e-MATH via the World Wide Web at the URL <http://www.ams.org/publications/>. Subscription prices for Volume 351 (1999) are as follows: for paper delivery, \$1191 list, \$953 institutional member, \$1072 corporate member; for electronic delivery, \$1072 list, \$858 institutional member, \$965 corporate member. Upon request, subscribers to paper delivery of this journal are also entitled to receive electronic delivery. If ordering the paper version, add \$27 for surface delivery outside the United States and India; \$50 to India. Expedited delivery to destinations in North America is \$45; elsewhere \$142. For paper delivery a late charge of 10% of the subscription price will be imposed upon orders received from nonmembers after January 1 of the subscription year.

**Back number information.** For back issues see the *AMS Catalog of Publications*.

Subscriptions and orders should be addressed to the American Mathematical Society, P.O. Box 5904, Boston, MA 02206-5904. *All orders must be accompanied by payment.* Other correspondence should be addressed to P.O. Box 6248, Providence, RI 02940-6248.

**Copying and reprinting.** Material in this journal may be reproduced by any means for educational and scientific purposes without fee or permission with the exception of reproduction by services that collect fees for delivery of documents and provided that the customary acknowledgment of the source is given. This consent does not extend to other kinds of copying for general distribution, for advertising or promotional purposes, or for resale. Requests for permission for commercial use of material should be addressed to the Assistant to the Publisher, American Mathematical Society, P. O. Box 6248, Providence, RI 02940-6248. Requests can also be made by e-mail to [reprint-permission@ams.org](mailto:reprint-permission@ams.org).

Excluded from these provisions is material in articles for which the author holds copyright. In such cases, requests for permission to use or reprint should be addressed directly to the author(s). (Copyright ownership is indicated in the notice in the lower right-hand corner of the first page of each article.)

---

*Transactions of the American Mathematical Society* is published monthly by the American Mathematical Society at 201 Charles Street, Providence, RI 02904-2213. Periodicals postage is paid at Providence, Rhode Island. Postmaster: Send address changes to *Transactions*, American Mathematical Society, P.O. Box 6248, Providence, RI 02940-6248.

© 1999 by the American Mathematical Society. All rights reserved.

This journal is indexed in *Science Citation Index*®, *Science Citation Index*™-Expanded, *ISI Alerting Services*®, *CompuMath Citation Index*®, and *Current Contents*®/Physical, Chemical & Earth Sciences.

Printed in the United States of America.

⊗ The paper used in this journal is acid-free and falls within the guidelines established to ensure permanence and durability.

10 9 8 7 6 5 4 3 2 1      04 03 02 01 00 99

TRANSACTIONS OF THE AMERICAN MATHEMATICAL SOCIETY  
CONTENTS

Vol. 351, No. 1

Whole No. 764

January 1999

<b>Kenneth J. Dykema</b> , Simplicity and the stable rank of some free product $C^*$ -algebras .....	1
<b>Joyce Wagner</b> , An algorithm for calculating the Nielsen number on surfaces with boundary .....	41
<b>Alexander Blokh and Michał Misiurewicz</b> , Rotating an interval and a circle .....	63
<b>Hans P. Heinig and Sichun Wang</b> , Maximal function estimates of solutions to general dispersive partial differential equations .....	79
<b>Nakao Hayashi and Pavel I. Naumkin</b> , Large time asymptotics of solutions to the generalized Benjamin-Ono equation .....	109
<b>M. F. Newman and E. A. O'Brien</b> , Classifying 2-groups by coclass ....	131
<b>M. D. Crossley</b> , Monomial bases for $H^*(CP^\infty \times CP^\infty)$ over $A(p)$ .....	171
<b>Fiona Murnaghan and Joe Repka</b> , Reducibility of some induced representations of $p$ -adic unitary groups .....	193
<b>A. J. Zaslavski</b> , Turnpike property for extremals of variational problems with vector-valued functions .....	211
<b>J. F. van Diejen</b> , Properties of some families of hypergeometric orthogonal polynomials in several variables .....	233
<b>Alexander Vardy</b> , Density doubling, double-circulants, and new sphere packings .....	271
<b>F. Andreu, J. M. Mazón, S. Segura de León, and J. Toledo</b> , Existence and uniqueness for a degenerate parabolic equation with $L^1$ -data .....	285
<b>Corran Webster and Soren Winkler</b> , The Krein-Milman theorem in operator convexity .....	307
<b>Tony Falcone and Masamichi Takesaki</b> , Operator valued weights without structure theory .....	323
<b>Jiehua Mai</b> , Multi-separation, centrifugality and centripetality imply chaos .....	343
<b>Jiehua Mai</b> , Scrambled sets of continuous maps of 1-dimensional polyhedra .....	353
<b>Yoshiaki Fukuma</b> , On sectional genus of quasi-polarized 3-folds .....	363
<b>Ted Chinburg, Carla D. Savage, and Herbert S. Wilf</b> , Combinatorial families that are exponentially far from being listable in Gray code sequence .....	379
<b>Alfredo O. Brega</b> , On the unitary dual of $Spin(2n, \mathbb{C})$ .....	403
<b>Anthony To-Ming Lau and Viktor Losert</b> , Ergodic sequences in the Fourier-Stieltjes algebra and measure algebra of a locally compact group .....	417

Hans-Joachim Baues, Quadratic homology .....	429
A. H. Dooley and N. J. Wildberger, Global character formulae for compact Lie groups .....	477
Brailey Sims and Michael A. Smyth, On some Banach space properties sufficient for weak normal structure and their permanence properties .....	497
Bin Liu, The stability of the equilibrium of reversible systems .....	515
Hajime Kaji, Homogeneous projective varieties with degenerate secants .....	533
Ismet Karaca, The nilpotence height of $P_t^s$ for odd primes .....	547
M. Pollicott and M. Yuri, Regularity of solutions to the measurable Livsic equation .....	559
Jochen Denzler, Windows of given area with minimal heat diffusion .....	569
Ch. Dorschfeldt and N. N. Tarkhanov, Golubev series for solutions of elliptic equations .....	581
Alexander Baranov and Alexander Kleshchev, Maximal ideals in modular group algebras of the finitary symmetric and alternating groups .....	595
T. Kappeler and B. Mityagin, Gap estimates of the spectrum of Hill's equation and action variables for KdV .....	619
Peter Dräxler, Idun Reiten, Sverre O. Smalø, Øyvind Solberg, and with an appendix by B. Keller, Exact categories and vector space categories .....	647
Edward L. Bueler, The heat kernel weighted Hodge Laplacian on noncompact manifolds .....	683
Andrzej Skowroński and Kunio Yamagata, Galois coverings of selfinjective algebras by repetitive algebras .....	715
Koichi Takase, On Siegel modular forms of half-integral weights and Jacobi forms .....	735
Brooks Roberts, The nonarchimedean theta correspondence for $\mathrm{GSp}(2)$ and $\mathrm{GO}(4)$ .....	781
Hiroshige Shiga and Harumi Tanigawa, Projective structures with discrete holonomy representations .....	813
Donald G. James, Conjugacy classes of $SU(h, \mathcal{O}_S)$ in $SL(2, \mathcal{O}_S)$ .....	825
Peer Christian Kunstmann, Distribution semigroups and abstract Cauchy problems .....	837

S. Z. Levendorskii, Asymptotic formulae with remainder estimates for eigenvalue branches of the Schrödinger operator $H - \lambda W$ in a gap of $H$ .....	857
------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

<b>Bernhard Lani-Wayda</b> , Erratic solutions of simple delay equations .....	901
<b>Tom Bohman</b> , Discrete threshold growth dynamics are omnivorous for box neighborhoods .....	947
<b>Gaoyong Zhang</b> , Dual kinematic formulas .....	985
<b>D. V. Alekseevsky, S. Marchiafava, and M. Pontecorvo</b> , Compatible complex structures on almost quaternionic manifolds .....	997
<b>C. Krattenthaler and M. Prohaska</b> , A remarkable formula for counting nonintersecting lattice paths in a ladder with respect to turns .....	1015
<b>Kerstin Waas</b> , On graphs with a metric end space .....	1043
<b>Maohua Le</b> , On the diophantine equation $(x^3 - 1)/(x - 1) = (y^n - 1)/(y - 1)$ .....	1063
<b>Xiaotie She</b> , On the non-vanishing of cubic twists of automorphic $L$ -series .....	1075
<b>Michael L. Mihalik</b> , Group extensions and tame pairs .....	1095
<b>Piotr Minc</b> , A weakly chainable tree-like continuum without the fixed point property .....	1109
<b>Greg Arone</b> , A generalization of Snaith-type filtration .....	1123
<b>Thierry Coulhon and Xuan Thanh Duong</b> , Riesz transforms for $1 \leq p \leq 2$ .....	1151
<b>Joachim Grispolakis, John C. Mayer, and Lex G. Oversteegen</b> , Building blocks for quadratic Julia sets .....	1171
<b>Walter Miller and Ethan Akin</b> , Invariant measures for set-valued dynamical systems .....	1203
<b>Hervé Jacquet and Yangbo Ye</b> , Germs of Kloosterman integrals for $GL(3)$ .....	1227
<b>Matej Brešar and Peter Šemrl</b> , On locally linearly dependent operators and derivations .....	1257
<b>S. Pumplün</b> , Composition algebras over rings of genus zero .....	1277

Vol. 351, No. 4

Whole No. 767

April 1999

<b>Dan Laksov and Anders Thorup</b> , These are the differentials of order $n$ .....	1293
<b>Stefan Geiss</b> , A counterexample concerning the relation between decoupling constants and UMD-constants .....	1355
<b>Steven N. Evans and Ruth J. Williams</b> , Transition operators of diffusions reduce zero-crossing .....	1377
<b>Manfredo P. do Carmo and Detang Zhou</b> , Eigenvalue estimate on complete noncompact Riemannian manifolds and applications .....	1391
<b>Valera Berestovskii, Conrad Plaut, and Cornelius Stallman</b> , Geometric groups. I .....	1403
<b>Gabor Toth</b> , Universal constraints on the range of eigenmaps and spherical minimal immersions .....	1423
<b>Kit C. Chan and Željko Čučković</b> , $C^*$ -algebras generated by a subnormal operator .....	1445

<b>Juris Steprāns</b> , Decomposing Euclidean space with a small number of smooth sets .....	1461
<b>Rahul Pandharipande</b> , Intersections of $\mathbb{Q}$ -divisors on Kontsevich's moduli space $\overline{M}_{0,n}(\mathbb{P}^r, d)$ and enumerative geometry .....	1481
<b>Kevin Corlette and Alessandra Iozzi</b> , Limit sets of discrete groups of isometries of exotic hyperbolic spaces .....	1507
<b>George M. Bergman</b> , Supports of derivations, free factorizations, and ranks of fixed subgroups in free groups .....	1531
<b>Ll. Alsedà, S. Kolyada, J. Llibre, and L<sup>V</sup>. Snoha</b> , Entropy and periodic points for transitive maps .....	1551
<b>Ian Melbourne</b> , Steady-state bifurcation with Euclidean symmetry .....	1575
<b>Der-Chen Chang, Galia Dafni, and Elias M. Stein</b> , Hardy spaces, BMO, and boundary value problems for the Laplacian on a smooth domain in $\mathbb{R}^n$ .....	1605
<b>Naihuan Jing and Kailash C. Misra</b> , Vertex operators for twisted quantum affine algebras .....	1663
<b>Benedict H. Gross and Wee Teck Gan</b> , Haar measure and the Artin conductor .....	1691

Vol. 351, No. 5

Whole No. 768

May 1999

<b>Robert S. Strichartz</b> , Isoperimetric estimates on Sierpinski gasket type fractals .....	1705
<b>Frank Morgan</b> , The hexagonal honeycomb conjecture .....	1753
<b>Takashi Shioya</b> , The limit spaces of two-dimensional manifolds with uniformly bounded integral curvature .....	1765
<b>Kevin A. Roper and Ted J. Suffridge</b> , Convexity properties of holomorphic mappings in $\mathbb{C}^n$ .....	1803
<b>Randall Dougherty and Greg Hjorth</b> , Reducibility and nonreducibility between $\ell^p$ equivalence relations .....	1835
<b>Michel Laurent and Damien Roy</b> , Criteria of algebraic independence with multiplicities and interpolation determinants .....	1845
<b>Günter Lettl, Attila Pethő, and Paul Voutier</b> , Simple families of Thue inequalities .....	1871
<b>Florian Deloup</b> , Linking forms, reciprocity for Gauss sums and invariants of 3-manifolds .....	1895
<b>Alfonso Castro and Hendrik J. Kuiper</b> , On the number of radially symmetric solutions to Dirichlet problems with jumping nonlinearities of superlinear order .....	1919
<b>A. I. Katsevich</b> , Local tomography with nonsmooth attenuation .....	1947
<b>Yunping Jiang</b> , Geometry of Cantor systems .....	1975
<b>Jingbo Xia</b> , On the contribution of the Coulomb singularity of arbitrary charge to the Dirac Hamiltonian .....	1989
<b>Qingbo Huang</b> , Harnack inequality for the linearized parabolic Monge-Ampère equation .....	2025



<b>Karma Dajani and Cor Kraaikamp</b> , A Gauss-Kusmin theorem for optimal continued fractions .....	2055
<b>Feliks Przytycki</b> , Conical limit set and Poincaré exponent for iterations of rational functions .....	2081
<b>Rudolf Scharlau and Pham Huu Tiep</b> , Symplectic group lattices .....	2101

Vol. 351, No. 6

Whole No. 769

June 1999

<b>Hon-kit Wai</b> , Witten-Helffer-Sjöstrand theory for $S^1$ -equivariant cohomology .....	2141
<b>P. S. Bourdon, J. A. Cima, and A. L. Matheson</b> , Compact composition operators on BMOA .....	2183
<b>L. Chiantini and C. Ciliberto</b> , Towards a Halphen theory of linear series on curves .....	2197
<b>Eero Hyry</b> , The diagonal subring and the Cohen-Macaulay property of a multigraded ring .....	2213
<b>Letterio Gatto and Fabrizio Ponza</b> , Derivatives of Wronskians with applications to families of special Weierstrass points .....	2233
<b>Dominique Foata and Doron Zeilberger</b> , A combinatorial proof of Bass's evaluations of the Ihara-Selberg zeta function for graphs .....	2257
<b>Ying-Qing Wu</b> , Dehn surgery on arborescent links .....	2275
<b>L. Ya. Vulakh</b> , Farey polytopes and continued fractions associated with discrete hyperbolic groups .....	2295
<b>Norihiro Minami</b> , The iterated transfer analogue of the new doomsday conjecture .....	2325
<b>Nancy Cardim</b> , Embeddings of open manifolds .....	2353
<b>M. Grinfeld and A. Novick-Cohen</b> , The viscous Cahn-Hilliard equation: Morse decomposition and structure of the global attractor .....	2375
<b>Qingtang Jiang</b> , Multivariate matrix refinable functions with arbitrary matrix dilation .....	2407
<b>Yuan Xu</b> , Summability of Fourier orthogonal series for Jacobi weight on a ball in $\mathbb{R}^d$ .....	2439
<b>Andrea Cianchi</b> , Hardy inequalities in Orlicz spaces .....	2459
<b>Christian Remling</b> , Embedded singular continuous spectrum for one-dimensional Schrödinger operators .....	2479
<b>Mako E. Haruta</b> , Newton's method on the complex exponential function .....	2499
<b>Miron Shpigel</b> , The ideal structure of some analytic crossed products ....	2515
<b>Stephen Doty</b> , Representation theory of reductive normal algebraic monoids .....	2539
<b>Richard B. Sowers and Jang-Mei Wu</b> , Thermal capacity estimates on the Allen-Cahn equation .....	2553

<b>N. P. Strickland</b> , Products on $MU$ -modules .....	2569
<b>Davar Khoshnevisan</b> , Brownian sheet images and Bessel-Riesz capacity .....	2607
<b>Greg Hjorth and Slawomir Solecki</b> , Vaught's conjecture and the Glimm-Effros property for Polish transformation groups .....	2623
<b>Jörg Brendle and Saharon Shelah</b> , Ultrafilters on $\omega$ —their ideals and their cardinal characteristics .....	2643
<b>Todd Eisworth and Judith Roitman</b> , CH with no Ostaszewski spaces .....	2675
<b>Ionuț Ciocan-Fontanine</b> , The quantum cohomology ring of flag varieties .....	2695
<b>Enrico Schlesinger</b> , A speciality theorem for Cohen-Macaulay space curves .....	2731
<b>Michel Coornaert and Athanase Papadopoulos</b> , Spherical functions and conormal densities on spherically symmetric $CAT(-1)$ -spaces .....	2745
<b>Michele Intermont</b> , An equivariant smash spectral sequence and an unstable box product .....	2763
<b>Nicholas D. Alikakos, Peter W. Bates, and Xinfu Chen</b> , Periodic traveling waves and locating oscillating patterns in multidimensional domains .....	2777
<b>Marek Izydorek</b> , Bourgin-Yang type theorem and its application to $Z_2$ -equivariant Hamiltonian systems .....	2807
<b>C. K. Qu and R. Wong</b> , "Best possible" upper and lower bounds for the zeros of the Bessel function $J_\nu(x)$ .....	2833
<b>Michal Fečkan</b> , Chaotic solutions in differential inclusions: Chaos in dry friction problems .....	2861
<b>Pierre Collet, Servet Martínez, and Bernard Schmitt</b> , On the enhancement of diffusion by chaos, escape rates and stochastic instability .....	2875
<b>D. N. Bessis and F. H. Clarke</b> , Partial subdifferentials, derivatives and Rademacher's Theorem .....	2899
<b>William Geller and Michał Misiurewicz</b> , Rotation and entropy .....	2927
<b>C. Badea and M. Mbekhta</b> , Compressions of resolvents and maximal radius of regularity .....	2949
<b>O. Kharlampovich, E. Lioutikova, and A. Myasnikov</b> , Equations in the $\mathbb{Q}$ -completion of a torsion-free hyperbolic group .....	2961
<b>Oliver Baues</b> , Left-symmetric algebras for $\mathfrak{gl}(n)$ .....	2979

<b>Zoé Chatzidakis and Ehud Hrushovski</b> , Model theory of difference fields .....	2997
--------------------------------------------------------------------------------------	------



<b>Piotr Koszmider</b> , Forcing minimal extensions of Boolean algebras .....	3073
<b>E. Schimmerling and J. R. Steel</b> , The maximality of the core model ...	3119
<b>Albrecht Böttcher and Yuri I. Karlovich</b> , Toeplitz operators with pc symbols on general Carleson Jordan curves with arbitrary Muckenhoupt weights .....	3143
<b>Manouchehr Ghamisari and David A. Herron</b> , Bilipschitz homogeneous Jordan curves .....	3197
<b>Minking Eie and Kwang-Wu Chen</b> , A theorem on zeta functions associated with polynomials .....	3217
<b>Elena V. Black</b> , Deformations of dihedral 2-group extensions of fields ....	3229
<b>Daniel S. Silver and Susan G. Williams</b> , Knot invariants from symbolic dynamical systems .....	3243
<b>John E. Gilbert and Andrea R. Nahmod</b> , Hardy spaces and a Walsh model for bilinear cone operators .....	3267
<b>Peter Sjögren</b> , An estimate for a first-order Riesz operator on the affine group .....	3301
<b>Brenda Praggastis</b> , Numeration systems and Markov partitions from self similar tilings .....	3315
<b>Dalibor Volný</b> , Invariance principles and Gaussian approximation for strictly stationary processes .....	3351
<b>Naoya Sumi</b> , Diffeomorphisms approximated by Anosov on the 2-torus and their SBR measures .....	3373
<b>Yehuda Shalom</b> , Invariant measures for algebraic actions, Zariski dense subgroups and Kazhdan's property (T) .....	3387
<b>D. J. Britten and F. W. Lemire</b> , On modules of bounded multiplicities for the symplectic algebras .....	3413
<b>H. Gammelin</b> , Gorenstein space with nonzero evaluation map .....	3433

Vol. 351, No. 9

Whole No. 772

September 1999

<b>N. J. Kalton and I. E. Verbitsky</b> , Nonlinear equations and weighted norm inequalities .....	3441
<b>Krzysztof Burdzy and Thomas S. Salisbury</b> , On minimal parabolic functions and time-homogeneous parabolic $h$ -transforms .....	3499
<b>Kevin Oden, Chiung-Jue Sung, and Jiaping Wang</b> , Spectral gap estimates on compact manifolds .....	3533
<b>Yukihiro Mashiko</b> , Convex functions on Alexandrov surfaces .....	3549
<b>Jeffrey T. Sheats</b> , A symplectic jeu de taquin bijection between the tableaux of King and of De Concini .....	3569
<b>Iwan M. Duursma</b> , Weight distributions of geometric Goppa codes .....	3609
<b>Greg Martin</b> , Dense Egyptian fractions .....	3641
<b>Matt Greenwood and Xiao-Song Lin</b> , On Vassiliev knot invariants induced from finite type 3-manifold invariants .....	3659
<b>B. H. Bowditch</b> , Connectedness properties of limit sets .....	3673

<b>Mohammed Moussaoui and Alberto Seeger</b> , Second-order subgradients of convex integral functionals .....	3687
<b>Piero Montecchiari, Margherita Nolasco, and Susanna Terracini</b> , A global condition for periodic Duffing-like equations .....	3713
<b>Elizabeth Ayer and Robert S. Strichartz</b> , Exact Hausdorff measure and intervals of maximum density for Cantor sets .....	3725
<b>Adam Sikora</b> , On the $L^2 \rightarrow L^\infty$ norms of spectral multipliers of "quasi-homogeneous" operators on homogeneous groups .....	3743
<b>Andreas Seeger, Stephen Wainger, James Wright, and Sarah Ziesler</b> , Classes of singular integrals along curves and surfaces .....	3757
<b>G. Ólafsson and B. Ørsted</b> , Causal compactification and Hardy spaces ...	3771
<b>Aner Shalev</b> , On the degree of groups of polynomial subgroup growth ....	3793
<b>Keqin Liu</b> , The trace space and Kauffman's knot invariants .....	3823
<b>D. J. Benson and Wayne W. Wheeler</b> , Direct sum decompositions of infinitely generated modules .....	3843
<b>J. A. de la Peña and M. Takane</b> , On the number of terms in the middle of almost split sequences over tame algebras .....	3857

Vol. 351, No. 10

Whole No. 773

October 1999

<b>Ben Ford</b> , Overgroups of irreducible linear groups, II .....	3869
<b>Yueyun Hu, Zhan Shi, and Marc Yor</b> , Rates of convergence of diffusions with drifted Brownian potentials .....	3915
<b>Joaquín Pérez and Antonio Ros</b> , The space of complete minimal surfaces with finite total curvature as lagrangian submanifold .....	3935
<b>Darko Milinković</b> , Morse homology for generating functions of Lagrangian submanifolds .....	3953
<b>Urs Lang</b> , Extendability of large-scale Lipschitz maps .....	3975
<b>Paolo Aluffi</b> , Chern classes for singular hypersurfaces .....	3989
<b>Juan Elias</b> , On the depth of the tangent cone and the growth of the Hilbert function .....	4027
<b>Daniel C. Cohen and Alexander I. Suciu</b> , Alexander invariants of complex hyperplane arrangements .....	4043
<b>Robert Carlson</b> , Inverse eigenvalue problems on directed graphs .....	4069
<b>Rong-Qing Jia</b> , Characterization of smoothness of multivariate refinable functions in Sobolev spaces .....	4089
<b>Adalberto P. Bergamasco</b> , Remarks about global analytic hypoellipticity .....	4113
<b>David K. Watson and Richard L. Wheeden</b> , Norm estimates and representations for Calderón-Zygmund operators using averages over starlike sets .....	4127
<b>Xiaofeng Wang and Duo Wang</b> , The $C^1$ closing lemma for nonsingular endomorphisms equivariant under free actions of finite groups .....	4173
<b>Ioannis A. Polyakis</b> , Minimal lattice-subspaces .....	4183

<b>Hongming Ding</b> , Weighted Laplace transforms and Bessel functions on Hermitian symmetric spaces .....	4205
<b>Dan Barbasch and Allen Moy</b> , Classification of one $K$ -type representations .....	4245
<b>Christopher Hoffman</b> , A $K$ counterexample machine .....	4263

Vol. 351, No. 11

Whole No. 774

November 1999

<b>Seok-Jin Kang and Myung-Hwan Kim</b> , Dimension formula for graded Lie algebras and its applications .....	4281
<b>Irene Hueter</b> , Limit theorems for the convex hull of random points in higher dimensions .....	4337
<b>Joachim Michel and Mei-Chi Shaw</b> , The $\bar{\partial}$ problem on domains with piecewise smooth boundaries with applications .....	4365
<b>Uwe Nagel</b> , Arithmetically Buchsbaum divisors on varieties of minimal degree .....	4381
<b>C. Krilloff</b> , Some interesting nonspherical tempered representations of graded Hecke algebras .....	4411
<b>Alexander I. Molev and Bruce E. Sagan</b> , A Littlewood-Richardson rule for factorial Schur functions .....	4429
<b>Li Guo and Linghsueh Shu</b> , Class numbers of cyclotomic function fields .....	4445
<b>Charles Radin and Lorenzo Sadun</b> , On 2-generator subgroups of $SO(3)$ .....	4469
<b>Norihiko Minami</b> , Hecke algebras and cohomotopical Mackey functors .....	4481
<b>Marianne Akian</b> , Densities of idempotent measures and large deviations .....	4515
<b>Nora C. Hopkins and Michael K. Kinyon</b> , Quadratic differential equations in $\mathbb{Z}_2$ -graded algebras .....	4545
<b>S.B. Damelin and A.B.J. Kuijlaars</b> , The support of the equilibrium measure in the presence of a monomial external field on $[-1, 1]$ .....	4561
<b>Stefan Müller</b> , A sharp version of Zhang's theorem on truncating sequences of gradients .....	4585
<b>P. Kiriakouli</b> , A classification of Baire-1 functions .....	4599
<b>Jong Uhn Kim</b> , An $L^p$ a priori estimate for the Tricomi equation in the upper half space .....	4611
<b>S. J. Bhatt, A. Inoue, and H. Ogi</b> , Admissibility of weights on non-normed $*$ -algebras .....	4629
<b>You Qing Ji</b> , Quasitriangular + small compact = strongly irreducible ....	4657
<b>Tianxuan Miao</b> , Decomposition of $B(G)$ .....	4675

<b>Ricardo Sa Earp and Eric Toubiana</b> , Symmetry of properly embedded special Weingarten surfaces in $H^3$ .....	4693
<b>Hirohiko Shima</b> , Homogeneous spaces with invariant projectively flat affine connections .....	4713
<b>Chien-Hsiung Chen</b> , Warped products of metric spaces of curvature bounded from above .....	4727
<b>Ian Graham and David Minda</b> , A Schwarz lemma for multivalued functions and distortion theorems for Bloch functions with branch points .....	4741
<b>T. Bloom and N. Levenberg</b> , Capacity convergence results and applications to a Berstein-Markov inequality .....	4753
<b>F. Thaine</b> , On the coefficients of Jacobi sums in prime cyclotomic fields ..	4769
<b>Nataša Kovačević</b> , Möbius-like groups of homeomorphisms of the circle .....	4791
<b>Nataša Kovačević</b> , Examples of Möbius-like groups which are not Möbius groups .....	4823
<b>Norio Iwase, Shiroshi Saito, and Toshio Sumi</b> , Homology of the universal covering of a co-H-space .....	4837
<b>R. Cominetti and O. Alemany</b> , Steepest descent evolution equations: asymptotic behavior of solutions and rate of convergence .....	4847
<b>Jan Andres, Grzegorz Gabor, and Lech Górniewicz</b> , Boundary value problems on infinite intervals .....	4861
<b>W. N. Everitt and L. Markus</b> , Complex symplectic geometry with applications to ordinary differential operators .....	4905
<b>E. B. Fabes, M. V. Safonov, and Yu Yuan</b> , Behavior near the boundary of positive solutions of second order parabolic equations. II .....	4947
<b>S. V. Konyagin and W. Schlag</b> , Lower bounds for the absolute value of random polynomials on a neighborhood of the unit circle .....	4963
<b>Volker Wrobel</b> , Optimal individual stability estimates for $C_0$ -semigroups in Banach spaces .....	4981
<b>R. Daniel Mauldin and Mariusz Urbański</b> , Conformal iterated function systems with applications to the geometry of continued fractions .....	4995
<b>Huaxin Lin</b> , When almost multiplicative morphisms are close to homomorphisms .....	5027
<b>Douglas L. Costa and Gordon E. Keller</b> , On the normal subgroups of $G_2(A)$ .....	5051
<b>Alain D'Amour and Michel Racine</b> , *-polynomial identities of matrices with the transpose involution: the low degrees .....	5089

